

# *Alysicarpus* (Leguminosae: Desmodieae) in Australia: a taxonomic revision

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## Summary

Pedley, Les (2001). *Alysicarpus* (Leguminosae: Desmodieae) in Australia. *Austrobaileya* 6 (1): 107–116. Nine species of *Alysicarpus* occur in northern Australia, three of them naturalised. All species are described and a key to their identification and notes on their geographical ranges and habitats are provided. *Alysicarpus aurantiacus*, *A. major* and *A. suffruticosus* are described as new.

Key words: Australia: *Alysicarpus*; *Alysicarpus aurantiacus*; *Alysicarpus major*; *Alysicarpus suffruticosus*.

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## Introduction

*Alysicarpus* is a genus of some 30 species restricted to the tropics and subtropics of the Old World. It is characterised by its scarious calyx with rather complex venation (Fig. 1) and the turgid articles of its pod, indehiscent, and round or oval in cross-section. Species of the genus are usually described as having leaves unifoliolate or ‘very rarely’ (Hutchinson 1964, Verdcourt 1971) or ‘less often’ (Ali 1977) trifoliolate. The leaves of all specimens from Australia examined are unifoliolate. It seems that species with predominantly trifoliolate leaves should be referred to *Desmodiastrum* Prain (Pramanik & Thothathri 1986).

No critical review of the Australia species has been published. Bentham (1864) recognised three species: *A. vaginalis* (L.) DC., *A. longifolius* Wight & Arn. and *A. rugosus* (Willd.) DC., all of them occurring also in India. From his notes to *A. rugosus* it is evident that he took a wide view of species. Schindler recognised that some specimens seen by Bentham represented species different from the Indian ones and described *A. brownii*, *A. muelleri* and *A. schomburgkii*. Probably because of its inflated pod he also transferred *Desmodium campylocaulon* F. Muell. ex Benth. to *Alysicarpus*, describing *Alysicarpus* sect. *Desmodiopsis* to accommodate it. The transfer

did nothing to sharpen the circumscription of *Desmodium* but a lot to obscure the limits of *Alysicarpus*. *Desmodium campylocaulon* is currently referred to *Desmodium*, albeit in a distinct section (Pedley 1999). Backer (1911) raised *A. rugosus* var. *ludens* Baker to specific rank and referred to it plants grown in Java from material received from Thursday Is., Queensland. Domin (1926) followed Bentham but described *A. rugosus* var. *longe-exsertus* and identified two specimens as *A. rugosus* var. *ludens* Baker. Presumably he was unaware of Backer’s treatment of the latter as he remarked that he had the impression that the taxon would make a good species. White & Francis (1920) recorded *A. bupleurifolius* as naturalised in Queensland.

Both *A. vaginalis* and *A. rugosus* occur in Africa, and critical work associated with the Flora Congo-Belge, Ruanda-Urundi and the Flora of Tropical East Africa has influenced the perception of species in Australia. Léonard (1954) distinguished *A. ovalifolius* from *A. vaginalis*; both appear to be recent introductions into Australia. The occurrence of the last has obscured the presence of two endemic species: *A. major*, a poorly collected species from the Kimberley region of Western Australia and *A. aurantiacus*, an eastern Australian species that extends to New Guinea.

**Key to native and naturalised (\*) species of *Alysicarpus***

1. Compact shrub to 1 m tall; stems and both surfaces of leaflets villose with dense spreading hairs 0.8–1 mm long; petioles 2–3 mm long; pod unknown ..... **8. *A. suffruticosus***  
 Annuals or perennials, prostrate or erect, usually sparingly branched; stems and leaflets only sparsely hairy, not villose ..... 2
2. Pod not, or only slightly, constricted between the articles; articles smooth or obscurely reticulately veined when dry; annual or perennial plants ..... 3  
 Pod markedly constricted between the articles; articles predominantly reticulately veined; plants annual ..... 8
3. Articles of pod glabrous, not at all rugose or reticulately veined; pod slightly constricted between the articles; calyx lobes overlapping at base of fruit ..... **3. \**A. bupleurifolius***  
 Articles of pod glabrous or pubescent, pod not constricted between them; calyx lobes not overlapping at base of fruit ..... 4
4. Leaflet lanceolate, 7–9 cm long, prominently reticulately veined on both surfaces; pod flattened ..... **2. *A. brownii***  
 Leaflet orbicular, broadly oblong, ovate or obovate, or lanceolate (sometimes all on a single plant), rarely more than 7 cm long (only in *A. schomburgkii*) obscurely reticulately veined when dry; articles scarcely flattened ..... 5
5. Flowers in short, rather open, racemes, terminal and in upper axils forming an open leafy panicle; leaflet 10–20(–24) mm wide; articles 2–3 mm long; plants annual ..... **6. \**A. ovalifolius***  
 Flowers in rather dense terminal racemes, seldom in upper axils; leaflets 3–12 mm wide; articles to 4 mm long; plants perennial ..... 6
6. Racemes dense, flowers overlapping at anthesis; pod articles somewhat flattened, pubescent, 3.5–4 mm long; seeds not seen, probably smaller than those of *A. aurantiaceus* and *A. vaginalis* ..... **4. *A. major***  
 Racemes open or dense; pod articles scarcely flattened, glabrous, to 3.5 mm long; seeds c. 2 × 1.5 mm. .... 7
7. Leaflets (2–) 3–15 times longer than wide, widest below the middle when elongate, acute, subacute, or rarely, in the lower part of the plant, rounded at the apex, drying greyish; inflorescence rather open at anthesis; calyx 5.5–7.7 mm long; standard 6.5–8 × 4–7 mm; petals orange or yellow ..... **1. *A. aurantiacus***  
 Leaflets 1.3–2.5 (–4) times longer than wide, widest at or above the middle, rounded at the apex, drying brown or greenish; inflorescences dense at anthesis; calyx 4.5–5 mm long; standard c. 6 × 3.4 mm; petals at least tinged pink, violet or purple ..... **9. \**A. vaginalis***
8. Calyx 7–9 mm long; pod articles 2.5–4 mm long, 3–3.3 (–4) mm wide, coarsely reticulate, pale straw-coloured when mature ..... **5. *A. muelleri***  
 Calyx 4–6 mm long; pod articles 1.5–2.5 mm long, 1.5–2 mm wide, finely transversely reticulate, black when mature ..... **7. *A. schomburgkii***

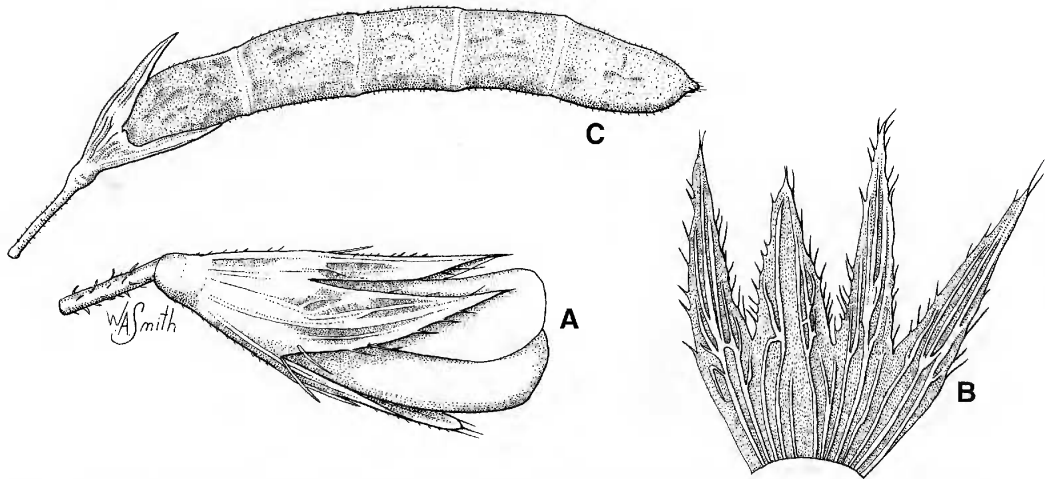


Fig. 1. *Alysicarpus aurantiacus*. A. Flower ( $\times 8$ ), just before opening. B. Calyx ( $\times 8$ ), flattened out, lower lobe at right. C. Pod ( $\times 4$ ), slightly immature. A, B, L.A. Craven 324; C, A.R. Bean 2901.

**1. *Alysicarpus aurantiacus* Pedley, sp. nov.** affinis et saepe confusus *A. vaginalis* (L.) DC. a quo foliis elongatioribus, 3–15 plo, rarius 2 plo, (non 1.3–2.5 plo) longioribus quam latis, infra medium latissimis ubi elongatis, cinereis in sicco, inflorescentia floribus sub anthesi non confertis, calycibus longioribus, 5.5–7.7 mm non 4.5–5 mm, petalis aurantiacis flavisve non roseis purpureis violaceisve tinctis differt. **Typus:** Queensland. NORTH KENNEDY DISTRICT: 45 km S of Townsville, 19°32'S, 146°45'E, 13 May 1979, L. Pedley 4588 (holo: BRI; iso: MEL).

*Alysicarpus vaginalis* auct. non (L.) DC: Bentham, Fl. Austral. 2: 239 (1864); Verdcourt, Man. New Guinea Leg.: 420 t. 98 (1979).

Prostrate or ascending perennial herb. Stem glabrous or with scattered appressed or ascending hairs and/or sparse weak uncinete hairs; stipules 6–15 (–18) mm long. Leaflet (10–) 15–45 (–50) mm long, 3–11 mm wide, (2–) 3–11 (–15) times longer than wide, narrowly lanceolate to narrowly ovate or oblong, subcordate to rounded at the base, subacute or rarely, on lower part or plant, obtuse at tip, mucronulate, glabrous or with scattered long hairs above, sparse or moderately dense appressed hairs beneath or hairs only on veins; petiolules 0.5–1 mm long; stipels somewhat longer than petiolules; petioles (3–) 5–8 (–10) mm long. Inflorescences rather open, terminal,

to c. 50 mm long; rachis with uncinete hairs; bracts ovate c. 4 mm long; pedicels paired, 1–2 mm long. Flowers orange or yellowish: calyx 5.5–7.7 mm long, the tube 1.7–2.2 mm, the lobes narrowly acute, not overlapping at base, the upper to 3.5 mm long, slightly shorter than the others, bifid at apex; corolla: standard obovate, 6.5–8 mm long, 4–7 mm wide; wings 5.5–6.5 mm long, clawed, lamina oblong; keel petals about as long as wings; ovary uncinately pubescent. Pods with up to 8 articles, straight, not constricted between seeds, to c. 20 mm long; articles obscurely reticulate, uncinately pubescent, (2–) 2.5–3.5 mm long, 2–2.5 mm wide; seeds 1.4–2 mm long, 1.2–1.5 mm wide. Fig. 1.

**Selected specimens:** **Papua New Guinea.** CENTRAL DISTRICT: Moitaka, 9°30'S 147°10'E, Dec 1964, Gillison NGF 22038 (BRI); MILNE BAY DISTRICT: near Modino, north east of Cape Vogel Pen., Sep 1954, Hoogland 4676 (BRI). **Queensland.** COOK DISTRICT: Lockerbie, 10 miles [16 km] WSW of Somerset, Apr 1948, Brass 18463 (BRI); Endeavour River, in 1882, Persietz 261 (MEL). NORTH KENNEDY DISTRICT: Saltwater Creek [Rockingham Bay], Nov 1865, Dallachy (MEL); Townsville, Feb 1918, White s.n. (BRI). SOUTH KENNEDY DISTRICT: Kelsey Creek, Michael 814 (BRI); 24.3 km from Proserpine towards Mackay, 20°35'S 148°37'E, Apr 1991, Bean 2901 (BRI). PORT CURTIS DISTRICT: Rockhampton, Feb 1868, O'Shanesy No.15 ser. 9 (MEL); Boreen, Oct 1935, Kahler (BRI).

**Distribution and habitat:** *Alysicarpus aurantiacus* extends from southern New Guinea through coastal districts of Queensland from Cape York to about Maryborough. It grows among grasses (often *Heteropogon*

*contortus* or *Themeda triandra*) usually in eucalypt communities.

**Affinities:** The species is closely related to, and often confused with, *A. vaginalis*. It differs in its more open inflorescences, its more elongate, usually subacute leaflets and orange or yellowish flowers. Its leaflets dry greyish whereas those of *A. vaginalis* are brown or retain a greenish tinge.

**Etymology:** The specific epithet is Latin meaning 'orange', a reference to the colour of the flowers of the species.

**2. *Alysicarpus brownii*** Schindler, *Trans. & Proc. Bot. Soc. Edinb.* 26:286 (1915).

**Type:** Northern Australia, [Melville Bay (Arnhem Bay North), 16 February 1803, see below], *R. Brown*, 'Iter Australiense 4176' (holo: E; iso: BM, K).

*A. longifolius* auct non (Spreng.) Wight & Arn.: Benth., *Fl. Austral.* 2:239 (1864).

Perennial with erect annual stems to 2.5 m tall (teste *Maconochie* 2000) from persistent rootstock. Stem terete, faintly longitudinally striate, uncinately pubescent, often with a few appressed hyaline hairs c. 0.5 mm long, glabrescent; stipules scarious, long pointed 15–25(–30) mm long. Leaflet narrowly lanceolate or linear lanceolate, sharply acute, slightly cordate or rounded at base, the margin slightly inrolled, (65–) 85–130 (–160) mm long, 3.5–10 (–15) mm wide, (10–) 12–22 (–27) times longer than wide, rather coriaceous, conspicuously reticulately veined on both surfaces, glabrous except for some uncinately hairs on veins and long appressed ones on margins and midribs beneath; petiolule 0.5–1.5 mm long; stipels cartilaginous, about as long as petiolules; petioles (3–)7–12 mm long. Inflorescence terminal, open in fruit, to c. 30 cm long; rachis densely uncinately pubescent; primary bracts ovate acuminate, 4–6 mm long, secondary bracts linear about half as long, all early deciduous; pedicels paired, densely pubescent, 0.5–3 mm long at anthesis, slightly longer in fruit. Flowers yellow or orange; calyx 4–5.5 mm long, densely uncinately pubescent, with stiff hyaline hairs on lobes, tube 1.6–2 mm long, lobes 2.2–3.5, the upper one slightly

shorter than the others, bifid for c. 1 mm; corolla: standard broadly obovate, 6.5–8 mm long, 5–6.5 mm wide; wings 6–7.3 mm long (including claw 1–2 mm long), 1.6–2 mm wide; keel petals about as long as keel, not clawed; ovary uncinately pubescent, occasionally with some hyaline hairs at apex extending to base of style. Pods with up to five somewhat flattened articles each 3.5–4 mm long, 2–2.5 mm wide (somewhat smaller than described by Schindler), obscurely reticulately veined, uncinately pubescent, slightly thickened at the septum when dry; seeds not seen.

**Selected specimens:** Northern Territory. Berry Springs, 12°42'S 131°00'E, Dec 1974, *Must* 1337 (DNA); Katherine Experimental Station, 14°27'S 132°15'E, Jan 1978, *Maconochie* 2310 (DNA, K); 9.5 km S. of Fish River homestead turn-off, Jun 1974, *Maconochie* 2000 (BRI, DNA, K); no definite locality (possibly Nabarlek, 12°22'S 133°22'E), Apr 1982, *Hinz* s.n. (DNA).

**Distribution and habitat:** The species is confined to the north of the Northern Territory where it is reported to occur in eucalypt communities, probably in seasonally waterlogged sites. It is poorly collected and is evidently rare.

**Affinities:** In its protologue, Schindler noted *Alysicarpus brownii* to be nearly related to *A. vaginalis*. It differs in its erect habit, longer leaves, larger flattened pod-articles and colour of the flowers. It is probably closer to the yellow-flowered endemic *A. major* but differs in its habit and size and shape of leaflets.

**Notes:** Type material at E and K has no details of a collecting locality, but the isotype at BM is well labelled. The article of the pods on the specimens examined are somewhat smaller than as described by Schindler.

**3. *Alysicarpus bupleurifolius*** (L.) DC., *Prodr.* 2: 352 (1825); White & Francis, *Bot. Bull. (Qld Depart. Ag. & Stock)* 22: 15 (1920); Meeuwen, *Reinwardtia* 6: 88 (1961); Verdcourt, *Man New Guinea Leg.* 420. t. 98G (fruit) (1979); Nguyễn, *Fl. Camb. Laos Vietnam* 23:130 t. 22, 1–5 (1987); Pedley, *Rev. Handb. Fl. Ceylon* 10: 153 (1996). *Hedysarum bupleurifolium* L., *Sp. Pl.* 745 (1753). **Type:** herb. Linnaeus 921.3 (LINN).



Erect or ascending annual herb. Branches with covering of appressed hairs, becoming glabrous; stipules acute, 3–10 mm long. Leaflet narrowly ovate on young plants, lanceolate to linear on older ones, rounded at the base acute at the apex, usually 30–70 mm long, 3–4.5 mm wide, 10–20 times longer than wide, occasionally down to 5 mm long, up to 9 mm wide and only twice as long as wide, glabrous on upper surface, sparse appressed hairs on lower; prominently reticulately veined on both surfaces; petiolules 0.5–1 mm long; stipels minute or absent; petioles 2–4 mm long. Inflorescences terminal, dense, to 20 mm long in flower, open, to 50 mm or more in fruit; rachis glabrous; pairs of flowers subtended by acute or acuminate bract, deciduous at anthesis; pedicels 0.8–1.5 mm long, with ascending brown hairs, becoming glabrous. Flowers: calyx rather stiff, angled towards the base, 6–7 mm long, the lobes equal in length, strongly overlapping at the base, 4–5 mm long, the upper entire or shortly bifid, glabrous; corolla orange and purple; standard oblong 4–5 mm long, 1.5–2.5 mm wide, the wings and keel petals about equal in length, shorter, about 4 mm long; ovary glabrous. Pods to 15 mm long, slightly to markedly exerted from the calyx, not constricted between the articles; articles 3–8, cylindrical or slightly flattened, 1.6–2 mm long, 1.3–2 mm wide, smooth or very obscurely reticulately veined, glabrous; seeds almost cubic, about 1 mm long and 0.8 mm wide.

**Selected specimens (all BRI): Queensland.** COOK DISTRICT: Mareeba, Apr 1962, *McKee* 9069. NORTH KENNEDY DISTRICT: Cromarty, near Townsville, Mar 1933, *White* 8842. LEICHHARDT DISTRICT: Camp Gully, 45 miles [72 km] SSW of St Lawrence, May 1962, *Johnson* 2293. PORT CURTIS DISTRICT: Rodds Bay, near Gladstone, Mar 1955, *Shaw* s.n. WIDE BAY DISTRICT: Bundaberg, near city centre, Mar 1980, *Stanley* 962. MORETON DISTRICT: The Gap, Brisbane, Feb 1963, *Blake* 22024 (CANB, K, MEXU).

**Distribution and habitat:** The species ranges from India, Sri Lanka and south-east Asia through Malesia to Australia. In Australia it occurs in coastal and subcoastal districts between Mareeba and Brisbane, on roadsides and in eucalypt communities often on drainage lines. Some collectors have noted its being relished by cattle. It is probably a recent introduction to Australia first collected near Townsville in 1918.

**Affinities:** *Alysicarpus bupleurifolius* is a well defined species showing little variation in Australia and is not often confused with any other species. In habit it resembles *A. schomburgkii* which, however, has pods strongly reticulately veined, constricted between the articles.

**4. *Alysicarpus major* Pedley, sp. nov.** similis *A. vaginali* (L.) DC. a quo floribus flavidis (non subroseis purpurascensibusve) vexillo majore c. 8 mm longo, leguminum articulis aliquantum complanatis pubescentibus longioribus 3.5–4 mm (non 2–3 mm) longis differt. **Typus:** Western Australia. Donkeys Creek, 29 km S of 'Drysdale River' Station, c. 15°27'S 126°20'E, 25 May 1975, *D.E. Symon* 10165 (holo: AD; iso: PERTH & (n.v.) NSW).

Prostrate or ascending perennial. Stems from stout tap-root with scattered short weak uncinat hairs, glabrescent; stipules (8–) 12–15 mm long. Leaflet somewhat dimorphic, short towards base of plant, 15–25 (–30) mm long, 7–14 (–16) mm wide, (1.4–) 1.8–2.4 (–3) times longer than wide, oblong (rarely ovate), obtuse mucronulate at the apex, cordate at the base, glabrous above with stiff appressed hairs beneath, strongly reticulately veined on both surfaces; petiolule c. 1 mm long; stipels about as long as the petiolules; petiole 4–7 mm long. Inflorescence terminal, rather dense at anthesis, pedicels paired, 1.5–2 mm long, bracts not seen. Flowers: calyx 5–5.5 mm long with minute uncinat hairs on tube and longer appressed hairs on lobes, tube 1.8–2 mm long, upper lobe 3–3.5 mm long, bifid for 1–1.5 mm, lateral lobes 3.2–3.5 mm long, lower lobe 3–3.2; corolla: standard (orange) c. 8 mm long, 3.5 mm wide, wings 5.3–5.6 mm long, the claw 1.2–1.3 mm long, c. 1.6 mm wide, keel petals (reddish) c. 6 mm long, not clawed; ovary with a few long hairs at the apex. Pod to c. 20 mm long with up to 5 articles, not contracted, and sometimes with no perceptible junction, between them; articles slightly flattened, uncinately hairy, 3.5–4 mm long, c. 2.5 mm wide, the most proximal and distal larger than others; seeds not seen.

**Selected specimens:** Western Australia. Sir Graham Moore Is., S side, 13°56'S 120°33'E, Jul 1973, *Paul G. Wilson* 11310 (PERTH); ... Secure Bay, 16°27'S 124°13'E, May 1993, *Mitchell* 3130 (K, PERTH); King Leopold Ranges, close to road crossing of Fern Creek, (17°09' S 125° 16'E) c. 310 m, Apr 1988, *Sands* 4211 (BRI, K, PERTH).

**Distribution and habitat:** *Alysicarpus major* is known only from the Kimberley region of Western Australia where it is reported to grow on laterite.

**Affinities:** The species is related to *A. vaginalis* from which it differs in having orange and rust-red petals and larger, somewhat flattened hairy pod-articles. It also has some affinity with the endemic *A. aurantiacus* from eastern Australia which also has yellow or orange petals and pubescent pods but the articles of *A. aurantiacus* are smaller and its leaflet narrower.

**Etymology:** The epithet, Latin meaning 'larger' or 'greater', alludes to the plant's having somewhat larger flowers and fruits than its relative *A. vaginalis*.

**5. *Alysicarpus muelleri* Schindler, *Rep. spec. nov. reg. veg.* 22: 269 (1926). **Type:** Victoria River and Depot Creek, *F. Mueller* (holo or iso: K; iso (?): MEL).**

*A. muelleri* var. *clementii* Schindler, *op. cit.*: 270 (1926). **Syntypes:** Western Australia: between Ashburton and Yule Rivers, *Clement* s.n. (iso: K); between Ashburton and De Grey Rivers, *Clement* s.n. (iso: K).

*A. rugosus* var. *longe-exsertus* Domin, *Biblioth. Bot.* 89: 217 (1926). **Type:** in fl. Flinders River ad Hughenden, Feb 1910, *K. Domin* Iter australiense '4706' (lecto, chosen here: PR, herb. no 527404).

*A. rugosus* auct non (Willd.) DC.; Benth, *Fl. Austral.* 2: 239 (1864).

Erect annual to 1 m. tall. Stems with indumentum of short uncinata hairs and scattered long (0.5–1.5 mm) straight spreading or ascending hairs; stipules somewhat membranous, 3–10 (–20) mm long. Leaflet linear, oblong ovate-lanceolate or narrowly

ovate, obtuse or subacute, mucronulate at the apex, rounded or truncate at base, 25–75 mm long, 5–22 mm wide, 2.3–5 (–7) times longer than wide, glabrous or with scattered long hairs above, scattered long hairs and usually moderately dense microscopic uncinata hairs beneath; petiolules 1–1.5 (–2) mm long, stipels shorter than petiolules 0.3–1 (–1.5) mm long; petioles 2.5–6 (–7.5) mm long. Inflorescence terminal, dense; rachis with indumentum similar to that of stems, though occasionally with multicellular glandular hairs towards the tip; bracts concave, ovate, acuminate 5–6 (–8) mm long, 2–2.5 mm wide, indumentum similar to that of calyx, subtending two flowers; pedicel 1.5–4 mm long. Flowers with yellow standard and orange or red wings; calyx 7–9 mm long, the tube c. 1 mm long, the lobes distinctly overlapping at the base at anthesis, the upper united almost to the tip, the lower slightly longer than the others; corolla: standard obovate, slightly retuse, 5–6.5 mm long, 3–4 mm wide; wing 4–4.5 mm long, including claw 0.8–1.5 mm; keel petals strongly tapered to base but not clawed, about as long as the wings, ovary densely puberulent. Pod of usually 4 articles (occasionally 3 or 5) exerted from calyx; articles 2.5–4 mm long, 3–3.3 (–4) mm wide, coarsely transversely reticulate with scattered minute uncinata hairs, pale straw coloured when mature; seeds subglobular 2–2.4 mm long slightly less than 2 mm wide.

**Selected specimens:** Western Australia. Road Paddock c. 3 km S of Kalumburu Mission 14°18'05"S 126°39'08"E, Jun 1966, *Mitchell* 4437 (BRI, PERTH); Ord River, W of 'Ord River' Station 17°26'S 128°49'E, Apr 1977, *Pullen* 10754 (BRI, CANB). Northern Territory. Katherine Gorge Road, 5 miles [8 km] NE of Katherine, Mar 1964, *Adams* 903 (BRI, CANB, K); McArthur River, 16°46'S 135°45'E, May 1947, *Blake* 17812 (BRI, K); 25½ miles [41 km] W of 'Rockhampton Downs', Jun 1960, *Chippendale* NT 7125 (BRI, CANB). Queensland. BURKE DISTRICT: Kilty Plain, 18 km NW of Mt Isa, 20°37'S 139°21'E, Mar 1987, *Harris* 152 (BRI); 'Lydia Downs' c. 45 miles [72 km] NW of Maxwellton, Jan 1966, *Pedley* 1960 (BRI). LEICHHARDT DISTRICT: 'Lenton Downs' 65 miles [104 km] WNW of Nebo, May 1962, *Johnson* 2308 (BRI).

**Distribution and habitat:** *Alysicarpus muelleri* occurs across tropical Australia. It is a summer-growing annual virtually restricted to dark grey and brown clay soil in grassland dominated by Mitchell grass (*Astrebla* spp.) and Flinders grasses (*Iseilema* spp.). In the eastern part of

its range, however, it has been collected from sandy soils that have been tilled.

**Affinities:** The plant has been confused with *A. rugosus* sensu stricto, a plant not found in Australia, which has pod-articles finely transversely reticulate, black at maturity. It is certainly close to *A. rugosus* subsp. *reticulatus* Verdc. from Africa.

**6. *Alysicarpus ovalifolius* (Shumach.)**  
Léonard, *Bull. Jard. Bot. État. Brux.* 24: 88 t. 11 (1954), Fl. Congo Belge Ruanda-Burundi 5: 226. t. 13B (fruit) & t. 18 (1954); Verdcourt, Fl. Trop. East Africa. Leguminosae: Papilion. 493 (1971). *Hedysarum ovalifolium* Schumach, Beskrwelse af Guineeske Planter 359 (1829). **Type:** Africa: 'Guinea' [Ghana: Ada, *fide* Verdcourt], *Thonning* (holo: C, n.v., photograph in Léonard, *loc. cit.*).

Annual with main stem erect, sometimes to 1 m tall, lower branches prostrate or often whole plant ± prostrate. Stems strigose with scattered yellowish ascending hairs, occasionally with minute weak uncinately hairs, rarely glabrous; stipules narrowly triangular, 5–12 mm long. Leaflet orbicular, broadly oblong or obovate to narrowly ovate, rounded, truncate or slightly retuse at apex, subcordate or cordate at base, (8–) 15–40 (–50) mm long, 10–20 (–25) mm, 1.2–2.5 times longer than wide, glabrous above, minutely uncinately pubescent with some appressed hairs on veins beneath; petiolules (0.5–) 1 (–1.5) mm long; stipels cartilaginous, obtuse about as long as petiolules; petioles 3–9 (–12) mm long. Inflorescence open to moderately dense racemes, terminal and in upper axils, forming an often leafy panicle; rachis glabrous in fruit, pedicels paired 0.5–2 mm long; bracts 2–4 mm long, concave, acuminate. Flowers orange to red; calyx c. 4.5 mm long the tube 2 mm long, upper lobe c. 2 mm long, shortly bifid, the rest c. 2.5 mm long; corolla: standard obovate, c. 6 mm long and 4 mm, wings clawed, c. 5 mm long, 1.2 mm wide; keel petals slightly longer than wings, not clawed, c. 5.5 mm long, 1 mm wide; ovary uncinately pubescent. Pods ± cylindrical, not constricted between articles, to 24 mm long, with up to 8 articles each 2–3.5 mm long, 1.5–2 mm wide, obscurely reticulately veined

glabrous or minutely uncinately pubescent; seeds obloid, smooth, yellow or pale brown, variable in size, 1.7–3.2 mm long, 1–2.5 mm wide.

**Selected specimens:** **Western Australia.** Mitchell Plateau, Old Mining Camp, 14°50'S 125°51'E, Apr 1988, *Dunlop* 7906 (BRI, DNA, MEL, NSW, PERTH). **Northern Territory.** Melville Is., Garden Point barge landing, 11°24'S 130°25'E, Mar 1994, *Cowie* 4713 (BRI, DNA); Fog Dam area, about 40 miles [64 km] SE of Darwin, May 1959, *Chippendale* NT 6189 (BRI, DNA); 'Malapunya' Station, 16°58'S 135°49'E, Mar 1981, *Maconochie* 2628 (BRI, CANB, NT). **Queensland.** BURKE DISTRICT: 'Myra Vale', Normanton, Mar 1944, *Bell* s.n. (BRI). COOK DISTRICT: 'Heathlands', Mar 1992, *Johnson* 5200 & *Sharpe* (BRI); 4.8 km N of Little Laura River, Apr 1983, *Clarkson* 4782 (BRI). NORTH KENNEDY DISTRICT: Townsville, Feb 1918, *White* s.n. (BRI); Sinclair Bay, 20°05'S 148°26'E, Mar 1994, *Batianoff* 9403263 (BRI). PORT CURTIS DISTRICT: Cedarvale, 23°56'S 150°54'E, *Partridge* s.n. (BRI)

**Distribution and habitat:** *Alysicarpus ovalifolius* is a native of Africa, naturalised in Australia. The earliest collection seen is from Townsville in 1918. At present it occurs sporadically in the Kimberley region of Western Australia, the north of the Northern Territory (common around Darwin) and sporadically along the Queensland coast from Thursday Is. to a little south Rockhampton where it was recorded in cultivated land. It is found usually in disturbed situations on soils of various types, probably most commonly on sand. It is reported to be eaten readily by cattle and to make excellent hay.

**Affinities:** The species is closely related to *A. vaginalis* and the two are often confused. They are easily identified in the field but a small proportion of herbarium specimens is difficult to identify. Verdcourt (1971) mentioned intermediates between *A. ovalifolius* and *A. vaginalis* but none has been observed in Australia. Meeuwen (1961) and Dunlop *et al.* (1995) did not accept *A. ovalifolius* as distinct from *A. vaginalis*, though the latter, in a note, distinguished the two species quite well. In a well presented paper, Endo & Ohashi (1990) illustrated that attributes of the pod provided reliable distinctions between the two. As noted by them (*op. cit.*), *A. ovalifolius* occurs in the Philippines and the Lesser Sunda Is. and specimens from New Guinea (near Port Moresby, *Gillison* 22113, and near Lae, *Streimann & Kauro* NGF 27882 - both BRI) have also been seen. Leaflets of deapaupate



plants of *A. ovalifolius* may be only 7 mm long and 6 mm wide, but the open inflorescences, attributes of the pod and the presence of long hyaline antrorsely curved hairs on the stems distinguish it from *A. vaginalis*.

**7. *Alysicarpus schomburgkii* Schindler, *Repert. sp. nov. reg. veg.* 22: 269 (1926). **Syntypes:** Port Darwin, *Schomburgk* 84 (iso: K); Port Darwin, *Foelsche* 97 (iso: MEL); Palmer River, *Wycliffe* (iso: BM, MEL ?); Thursday Is., *Jaheri* s.n. (iso: K).**

*A. ludens* auct. non. (Baker) Backer; Backer, *Schooflora voor Java*: 349 (1911).

*A. rugosus* var. *ludens* auct. non Baker; Domin, *Bibliotheca Bot.* 89: 217 (1926).

Annual 60 cm, rarely to 1 m tall, main stem erect, basal branches ascending. Young stems angular throughout, glabrous or with appressed hairs on the angles or occasionally terete with hairs on ribs; stipules 2–12 (–14) mm long. Leaflet elliptic, narrowly ovate or narrowly obovate, obtuse at base of plant, becoming lanceolate, acute in upper part, rounded at base, 15–30 mm long, 3–7.5 mm wide, 2.5–7 times longer than wide becoming 30–145 mm long, 2.2–9 mm wide, 9–20 (–40) times longer than wide, glabrous on upper surface, stiff ± appressed hairs scattered on veins beneath and sometimes with sparse minute uncinat hairs; petiolules c. 0.5; stipels shorter than petiolules, sometimes absent; petioles 1.5–3 (–5.5) mm long. Inflorescence terminal, moderately dense; rachis with indumentum of minute uncinat hairs and usually longer stiff erect yellowish hairs; bracts ovate acute, 3–6 mm long, 1.5–3 mm wide, subtending 2 flowers; pedicels 1.5–3 (–5.5) mm long. Flowers yellow; calyx 4–6 (–8) mm long, the tube c. 1 mm long, lobes overlapping at base slightly at anthesis, upper lobe slightly bifid at tip; corolla: standard obovate, obtuse, 3.5–6 mm long, 2.5–4 mm wide; wings 4–5.5 mm long including claw c. 1 mm long; keel petals as long as or slightly shorter than wings, claw 1–1.5 mm long; ovary glabrous or minutely puberulent towards the tip. Pod to c. 8 mm long of 2–4 articles, deeply constricted between them, each 1.5–2.2 mm long, 1.5–2 mm wide, transversely reticulately

veined (not as closely or deeply as in *A. rugosus*), glabrous or sparsely puberulent, blackish when mature; seeds smooth, brown subglobular 1.4–1.6 mm long, 1.3–1.4 mm wide.

**Selected specimens:** **Western Australia.** near Manning gorge, 16°39'S 125°55'E, Jun 1978, *George* 15189 (PERTH). **Northern Territory.** Darwin, Oct 1946, *Blake* 17315 (BRI, CANB, MEXU, NT); Litchfield N.P., 13°03'S 130°50'E, Mar 1995, *Cowie* 5257 & *Taylor* (BRI, CANB, DNA, PERTH); Jabiru, 12°40'S 132°53'E, Feb 1973, *Dunlop* 3351 (BRI, CANB, DNA, MEL, MO). **Queensland.** COOK DISTRICT: Milman Hill, Thursday Is., 10°35'S 142°13'E, Apr 1986, *Clarkson* 6421 (BRI, DNA, K, L, MBA, MO, NSW, PERTH, QRS); Mareeba Mining Lease, c. 15 km SE of Mareeba, 17°15'S 145°30'E, Apr 1972, *Staples* 030472/5 (BRI, CANB).

**Distribution and habitat:** *Alysicarpus schomburgkii* is most common in the extreme north-west of the Northern Territory, with scattered occurrences in the Kimberley region of Western Australia and in the eastern tropical part of Queensland from Thursday Is. to about Proserpine on the central coast. It has been recorded from shallow skeletal soils, sands, red earths derived from laterite and rarely, heavy alluvial soil, occasionally near seasonally flooded depressions.

**Affinities:** The affinities of the species are with *A. rugosus* and, less closely, *A. muelleri*, both of which have pods less constricted between the articles which are also larger. The articles of *A. rugosus* have a closer, more sharply defined reticulum, and become much darker than those of *A. schomburgkii* when mature. Specimens examined suggest that plants from Queensland have smaller flowers than those from the Northern Territory. Their standards are 3.5–4 mm long (N.T.: 4.5 mm or more) and have 2 or 3 ovules (N.T. usually 4, occasionally 3).

Backer and Domin independently identified specimens from Australian as the Indian taxon currently accepted as *A. heyneanus* var. *ludens* (Baker) A. Pramanik & Thoth. (Pramanik & Thothathri 1983).

**8. *Alysicarpus suffruticosus* Pedley sp. nov.** affinis *A. vaginali* (L.) DC. a quo planta suffruticosa, petiolis brevioribus, foliolis utrinque villosis, et fortasse coloribus florum differt. **Typus:** Western Australia.



4 km NNW of Milliwindi road turn-off, opposite Mt Hart outcamp, 17°06'S 124°12'E, 15 April 1988, R.J. Cranfield 6401 (PERTH); iso (n.v.): CANB.

Compact subshrub to 30 cm tall with stout taproot. Stem ± terete, with dense spreading hairs c. 0.8 mm long and scattered weak uncinat hairs; stipules 3–6 mm long, 1.5–2 mm wide, acute, closely longitudinally veined, spreading and laciniate when old. Leaflet oblong or ovate, rounded or slightly retuse at the apex, rounded or slightly cordate at the base, 15–30 mm long, 8–16 mm wide, 1.2–2.5 times longer than wide, villose with weak hairs on both surfaces (or hairs somewhat shorter beneath, or less dense above) strongly reticulately veined beneath; petiolules c. 0.6 mm long; stipels about half as long as petiolules, often obscure; petioles 2–3 (–5) mm long. Inflorescences terminal to c. 80 mm long; rachis with uncinat hairs; bracts ovate acuminate, c. 4 mm long; secondary bracts c. 2 mm long, oblong, both early deciduous. Flowers 'pale pink' (*teste* Cranfield) or 'yellow and rust red' (*teste* Sands); calyx c. 5 mm long, the tube 1.5 mm, lobes narrow, acute, not overlapping at the base, the upper slightly shorter than the others, bifid at apex, indumentum of minute uncinat hairs with 0.8 mm long hyaline hairs on margin of lobes; corolla: standard obovate, obtuse, c. 8 mm long, 5 mm wide; wings 6.3 mm long (including claw 1 mm long), 1.3 mm wide; keel petals 5.7 mm long; ovary with indumentum of long appressed hairs, ovules 5, style truncate. Pods and seeds not seen.

**Selected specimen:** Western Australia. Old Settlement, Sunday Is., 16°24'S 123°11'E, Apr 1992, Mitchell 2231 (PERTH).

**Distribution and habitat:** *Alysicarpus suffruticosus* is known from the two localities cited, in the Kimberley region of Western Australia. It has been recorded from sandy soil in grassland and beneath *Livistona* sp.

**Affinities:** The species is allied to *A. vaginalis* and *A. aurantiacus* but is easily distinguished from both by its growth form and the villosity of its leaflets.

**Etymology:** The epithet is Latin meaning somewhat woody, an allusion to perennial shrubby habit of the species best shown in the *Sands* specimen cited.

**9. *Alysicarpus vaginalis* (L.) DC., Prodr. Syst. Veg. 2: 353 (1825); Meeuwen, Reinwardtia 6: 87 (1961) pro parte (incl. *A. ovalifolius*); Léonard, Fl. Congo Belge Ruanda-Urundi 5: 224 (1954); Verdcourt, Fl. Trop. East Africa. Leguminosae: Papilion. 493 (1971), Man. New Guinea Leg. (1979) pro parte (incl. *A. aurantiacus*); Nguyễn, Fl. Camb. Laos Viétnam 23: 128 (1987); Pedley, Rev. Handb. Fl. Ceylon 10: 152 (1996). **Lectotype:** Sri Lanka (Ceylon), herb. Hermann 1:27, No. 287 (BM), *vide* Verdcourt in Turland & Jarvis, Taxon 46:473 (1997).**

Prostrate perennial. Stems glabrous or sparsely minutely uncinat pubescent; stipules 4–12 (–15) mm long, often longer than the petioles. Leaflet broadly ovate or oblong (orbicular when young), rarely ovate, rounded at apex, cordate at base, (5–) 8–35 mm long, 4–12 (–14) mm wide 1.3–2.5 (–4) times longer than wide, glabrous above, sparsely uncinately pubescent beneath with scattered appressed hairs, sometimes only on veins; petiolule c. 0.3 mm long, stipels about as long as petiolules; petiole 4–10 mm long. Inflorescence terminal, dense at anthesis; rachis uncinately pubescent; bracts narrowly ovate, 4–5 mm long; pedicels paired, c. 1.5 mm long. Flowers bluish, purplish or mauve to wine red, not yellow or orange; calyx 4.5–5.5 mm long, tube 1.7–2.5 mm long, lobes subequal 2.3–3 mm long, the upper shortly bifid at apex, somewhat shorter than the other; corolla: standard ovate c. 6 mm long, 3–4 mm wide, wings as long as or slightly shorter than keel clawed, 4.5–6 mm long, 1–1.5 mm wide; keel petals not clawed, 5–6 mm long, 1.2–1.5 mm wide; ovary sparsely uncinately puberulent. Pods to 18 mm long with up to 8 articles, not contracted between them; articles drying black, obscurely coarsely reticulately veined when mature, 2–3 mm long, 2–2.3 mm wide; seeds obloid, c. 2 mm long, 1.3 mm wide.

**Selected specimens:** Northern Territory. c. 12°40'S 131°20'E, Sep 1946, Blake 17004 (BRI); Bamboo Point, Mary River, Apr 1972, Barrett 8 (DNA, K).

**Queensland.** COOK DISTRICT: Thursday Is., 10°35'S 142°13'E, Apr 1986, *Clarkson* 6444 (BRI, DNA, K, L, MBA, MEL, MO, NSW, PERTH, QRS); Rutland Plains near mouth of Mitchell River, Jun 1943, *Whitehouse* s.n. (BRI). NORTH KENNEDY DISTRICT: Nettle Creek, 10 km E. of Mt. Garnet, Jul 1990, *Silcock* S1050 (BRI). SOUTH KENNEDY DISTRICT: Slade Point, Mackay, 21°05'S 149°14'E, Apr 1975, *McDonald* 1304 & *Batianoff* (BRI). LEICHHARDT DISTRICT: Boothill Creek, 10 miles [16 km] S of Nebo turnoff on [Old] Bruce Highway, c. 21°50'S 148°55'E, Jun 1958, *Pedley* 270 (BRI). PORT CURTIS DISTRICT: North Rockhampton, Feb 1980, *Stanley* 557 (BRI).

**Distribution and habitat:** *Alysicarpus vaginalis* is widely spread in the tropics of the Old World but is probably a 20th century introduction to Australia. It is rare in the Kimberley region of Western Australia and the north of the Northern Territory but is more common in Queensland where it occurs in sandy soils in eucalypt communities. It is, however, essentially an urban weed, occurring in lawns and on road verges in Gladstone, Rockhampton, Mackay, Townsville and Cairns.

**Affinities:** The species is frequently confused with *A. ovalifolius*. The latter is a less conspicuously prostrate plant with much larger leaflets (when well grown) and always with a more open branched inflorescence. The differences between *A. vaginalis* and the indigenous *A. aurantiacus* are more subtle. *A. aurantiacus* has more elongate leaflets, a more open inflorescence, though not branched as in *A. ovalifolius*, and orange or yellow flowers. Herbarium specimens of the two are easily separated: *A. aurantiacus* dries greyish while *A. vaginalis* is either brown or retains a greenish tinge.

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